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CENAN-OP-W

DEC 1 4 1987

Memorandum for the Record
Subject: Arthur Kill Deepening: 2,3,7,8-TCDD Evaluation.

1. Analytical 2,3,7,8-TCDD results from North of Shooters Island reach of the Arthur Kill were received by CENAN-OP-W on 28 August 1987. The 2,3,7,8-TCDD analysis was subcontracted out to California Analytical Laboratories of Sacramento, Calif. This laboratory is an approved USEPA facility for Dioxin testing.

2. Individual composites from core locations 1, 2, 5, 8, 10 and 18 (site A) showed measurable 2,3,7,8-TCDD concentrations in five of the six samples tested. These samples were tested at detection limits ranging from 0.85 to 1.3 parts per trillion. Sample 5 reported a bulk sediment TCDD concentration of 15 pptr. This concentration fell within the 0-25 pptr FDA range which allows unrestricted ocean disposal of the project material at this core location site. Sample 8 reported a TCDD concentration of 31 pptr. In accordance with the FDA criteria set forth by the Interagency Dioxin Committee, ocean disposal with expeditious capping would be required at this core site. Sample 2 reported no measurable concentration of 2,3,7,8-TCDD. The other 3 samples (samples 1, 10 and 18) exceeded the FDA levels and would be unsuitable for ocean disposal.

3. CENAN-OP and CENAN-PL further decided to test extra frozen reference and test tissue from the three phase 10 day solid phase bioassay for tissue bioaccumulation of 2,3,7,8-TCDD. The organisms tested were the hard clam (Mercenaria mercenaria) and the sandworm (Nereis virens). Composite samples from the six sample sites that were previously bioassayed in January 1987 were sub-sampled to add up to a total of 25.0g per sample. Since no material was left from the original grass shrimp (Mysidopsis bahia) bioassay, this organism was excluded from the test. California Analytical was again subcontracted to analyze the samples. Detection limit for this analysis was 1 pptr.

4. A total of 20 samples were analyzed. This was comprised of five reference and five test samples from both the clam and sandworm. Detection limits ranged from 0.84 to 1.74 pptr. Reference material for both the clam and sandworm reported no detection of 2,3,7,8-TCDD. Of the 5 samples of test clam tissue analyzed, 2 samples reported measurable TCDD concentrations of 1.2 and 2.7 pptr. Three of the five clam samples reported no detection. All five tissue samples for the sandworm reported measurable TCDD concentrations of 1.9, 1.9, 2.3, 2.5 and 28.0 pptr respectively. The 28.0 pptr concentration was confirmed by Cal Anal. as a reliable concentration.

The greater affinity for measurable concentrations of TCDD in the sandworm may be explained by the higher percentage lipid content of the sandworm as compared to the clam. Whereas the clam averages between 1-2% lipid content, the sandworm ranges between 7-8% .

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5. There was no statistically significant difference between reference and test material for bioaccumulation potential.

In conclusion, the ten day solid phase bioaccumulation data analyzed for the 2,3,7,8-TCDD isomer of Dioxin (North of Shooters Island Reach, Arthur Kill) shows that there would be no significant uptake of this contaminant at the Mud Dump Site as compared to material outside this site.

6. On 10 November 1987, a meeting between the C, CENAN-OP and the C, CENAN-PL was held. CENAN-OP informed CENAN-PL that the North Shooters Island reach of the Arthur Kill was dredged as part of CENAN-OP O&M Navigation Dredging program. 79,950 cubic yards of dredged material from this reach that showed measurable TCDD concentrations were deposited at the former Mud Dump NE buoy site. This material was the last project deposited at the NE buoy. Since that time, it was decided to cap this dredged material with sand diverted from the Sandy Hook Federal Navigation Project. Not only would this plan cap the Arthur Kill dredged material, but it would serve as a final closure operation for the historic NE disposal site. The remaining 127,345 cubic yards of Arthur Kill sediment was deposited at the newly emplaced OM buoy. This sediment was the first project to be deposited at the new OM disposal site and is effectively buried.

7. Since this material was centralized in the shallow depths between 0-8.5 ft and removed by the regular Maintenance dredging operation, it will be necessary to retest some areas for bulk sediment 2,3,7,8-TCDD analysis for the Arthur Kill Deepening Project. Lithological logs provided by soils and foundations for the Arthur Kill were used to determine the closest boring holes to the existing cores as well as sediment types. The following table was prepared to illustrate CENAN-OP-W criteria for retesting.

Bioassay Cores	Closest Borings	Notes	Decision
1	DH 21 & 61 (KVK borings)	Appears to be glacial till below project depth (35').	No test
2		Outside channel	No test
5	DH 61 & 63	Appears to be sandy gravels below project depth (35').	No test
8	AK 233 & 234	Appears to be up to 6' of mud below project depth (35').	Retest
10	AK 237	Appears to be 6-8' of black mud below project depth (35').	Retest

18	AK 239 & 240	Appears to be sandy muds/clays and gravelly muds below project depth (35')	No test

In summary, it will be necessary to retest for bulk sediment 2,3,7,8-TCDD in the vicinity of bioassay cores 8 and 10.

Eric A. Stern
Oceanographer, Water Quality
Compliance Branch

Arthur Kill Deepening Project

Actual Tissue Concentration (10 day Bioassay)

	Reference (pptr)	Test
Mercenaria mercenaria (hard clam)		
	1. ND	1. ND
	2. ND	2. 1.2
	3. ND	3. ND
	4. ND	4. ND
	5. ND	5. 2.7
Nereis virens (sandworm)		
	1. ND	1. 2.5
	2. ND	2. 2.3
	3. ND	3. 1.9
	4. ND	4. 1.9
	5. ND	5. 28.0

No statistical difference between reference and test

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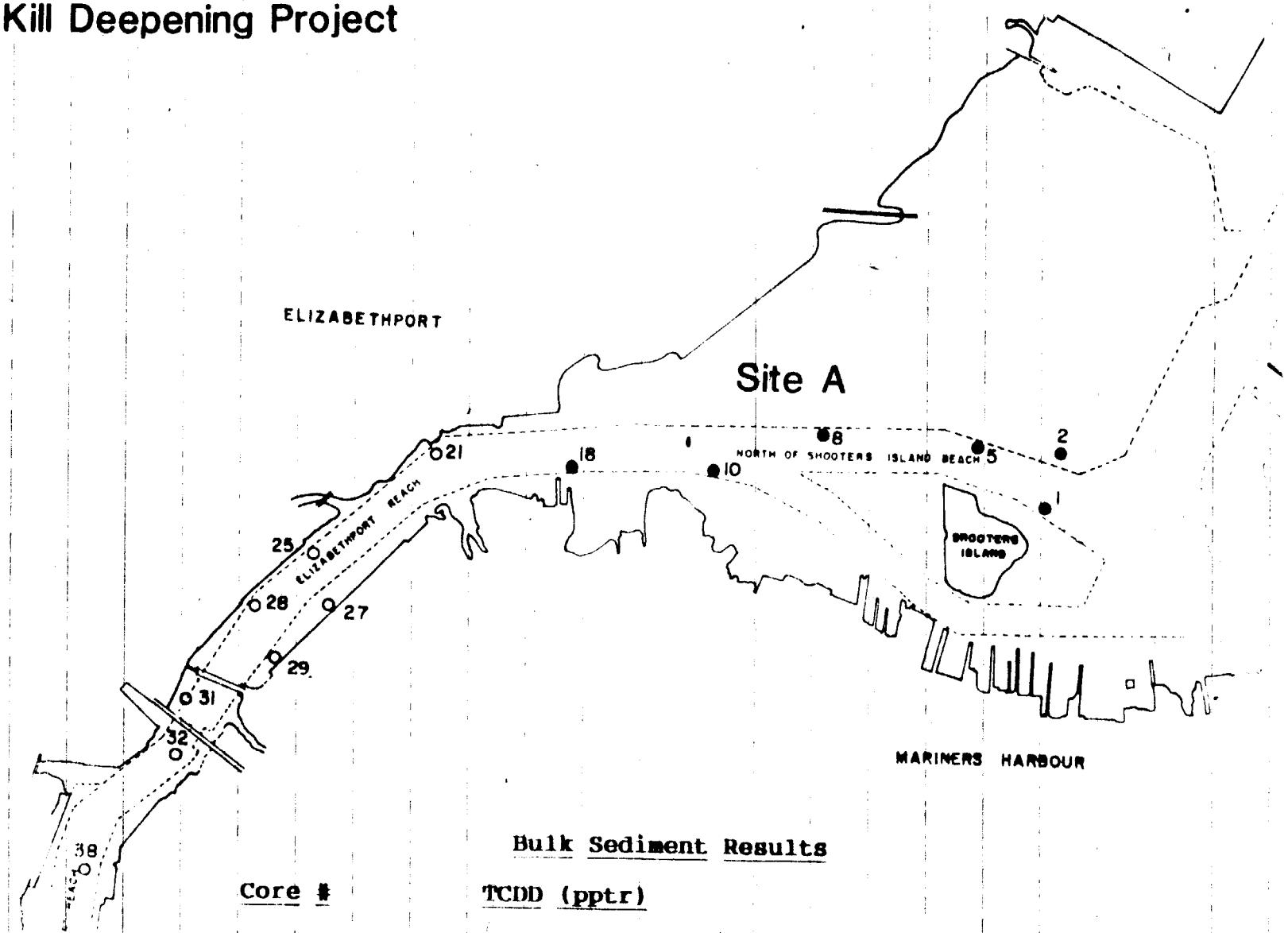
Arthur Kill Deepening Project



Bulk Sediment Results

Core #	TCDD (pptr)
1	240
2	ND
5	15
8	31
10	165
18	160

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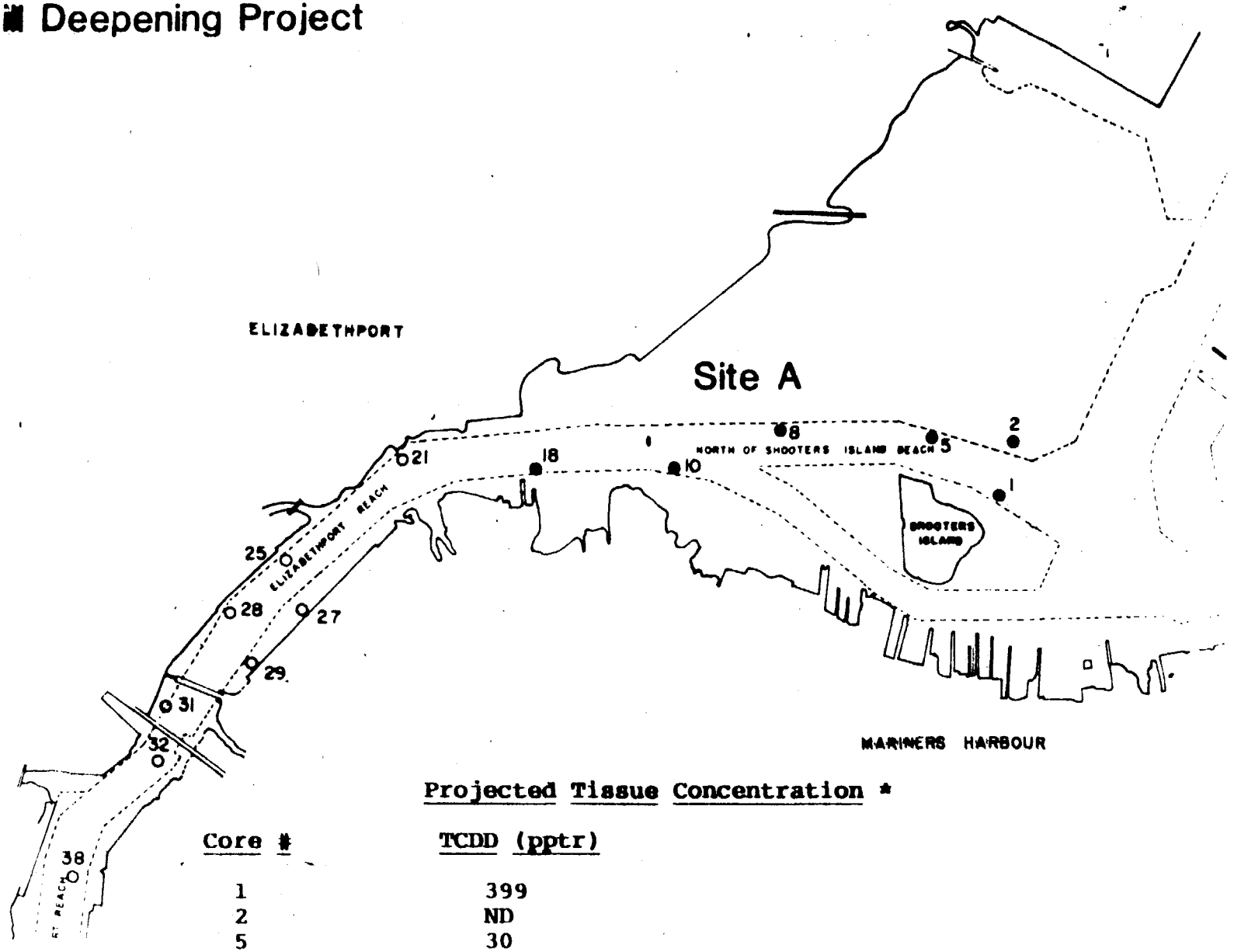
Arthur Kill Deepening Project



Projected Tissue Concentration *

Core #	TCDD (pptr)
1	399
2	ND
5	30
8	68
10	240
18	295

***Assumptions**

1. extreme worst conditions
2. all dioxin would be in a biologically available state
3. dioxin would be physically available to the organism
4. the organism would receive a lifelong exposure of dioxin

Applicant: Celanese Chemical Co., Inc.
Waterway : Passaic River
Volume : 25,000 cubic yards

Testing : Bulk sediment testing

Avg. Grain Size: (sand - 8.8%, silt - 65.4%, clay - 25.8%)

Sample	TOC%	LLD_{25}	pptr	LLD_{50}	[TCDD]	[TCDD DL - ppb]
1	3.3	23.6		47.2	ND	0.1
2	3.8	27.6		55.3	ND	0.1
3	3.2	23.6		47.1	ND	0.1
4	2.8	20.4		40.7	ND	0.1

Results : Require bulk sediment testing for 2,3,7,8-TCDD on each composite core sample to a lower detection limit than that achieved by Celanese. Based on the lowest LLD_{25}, Celanese is presently testing for 2,3,7,8-TCDD at a detection limit of 20 pptr.

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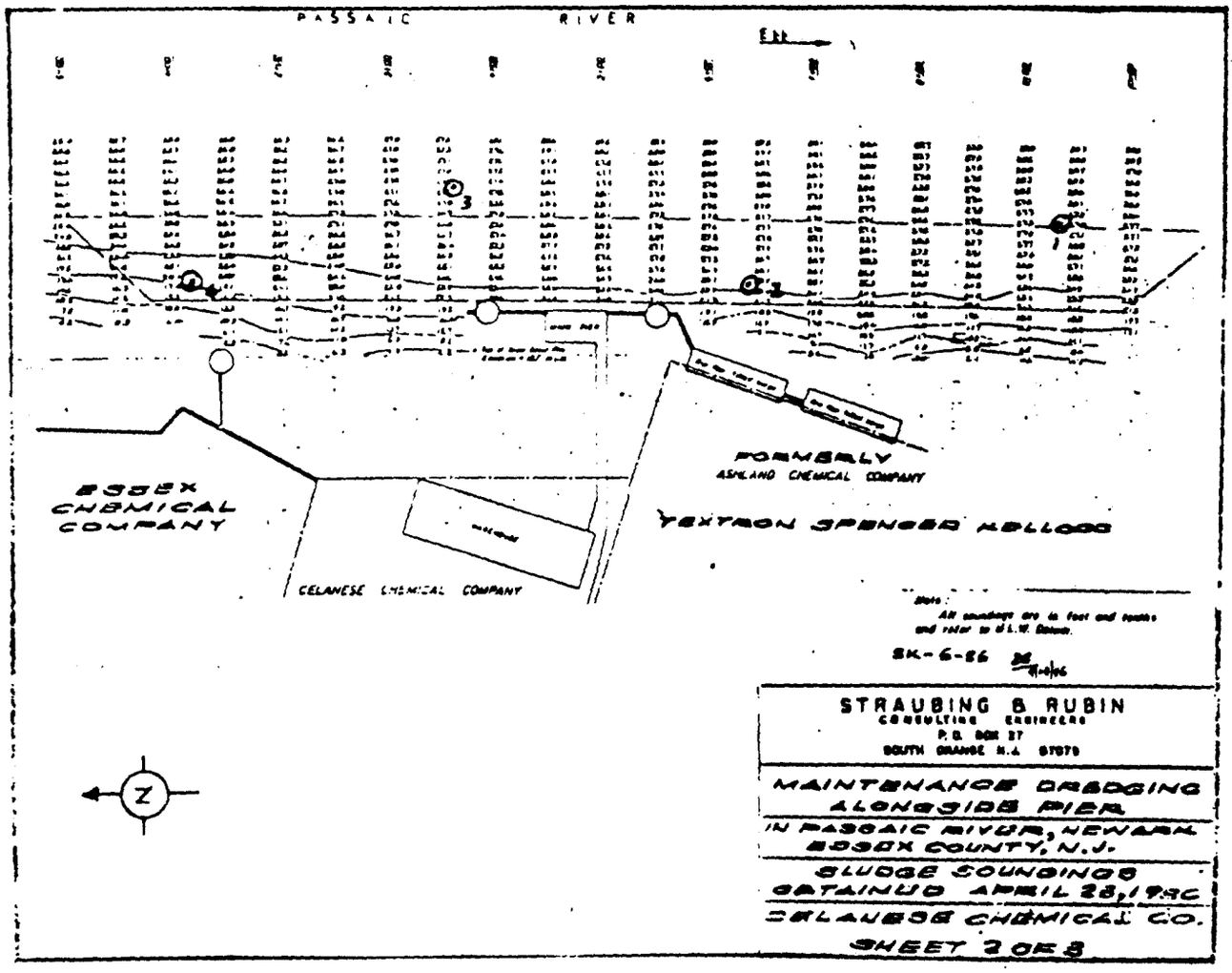


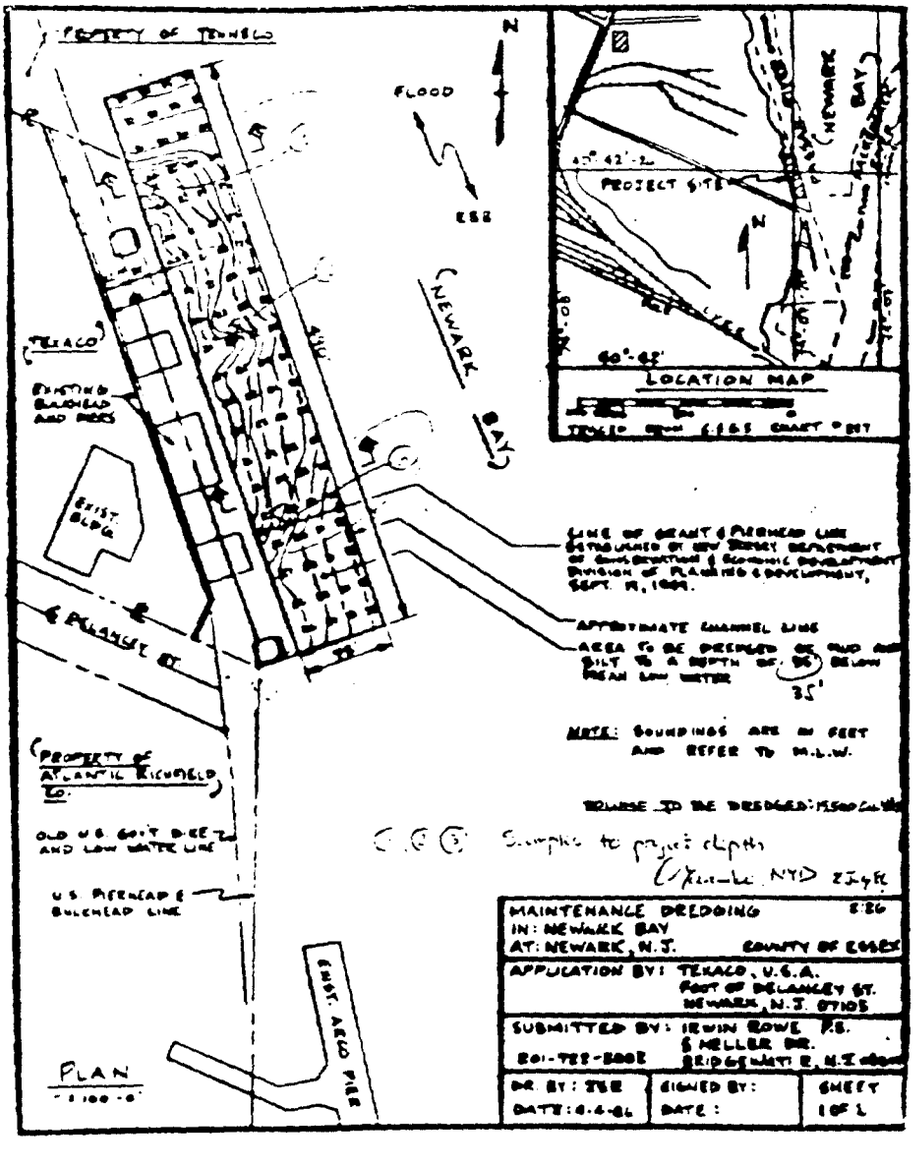
Applicant: Texaco Refining & Marketing
Waterway : Newark Bay
Volume : 15,500 cubic yards

Testing : Bulk sediment testing

Avg. Grain Size: (sand - 9.9%, silt - 70.7%, clay - 19.3%)

Sample	TOC%	LLD_{25}	pptr	LLD_{50}	[TCDD]	[TCDD DL]
1	2.7	19.5		39.1	ND	0.87
2	3.3	23.9		47.8	ND	1.0
3	4.0	29.0		58.0	ND	0.49

Results : No measurable TCDD concentration detected



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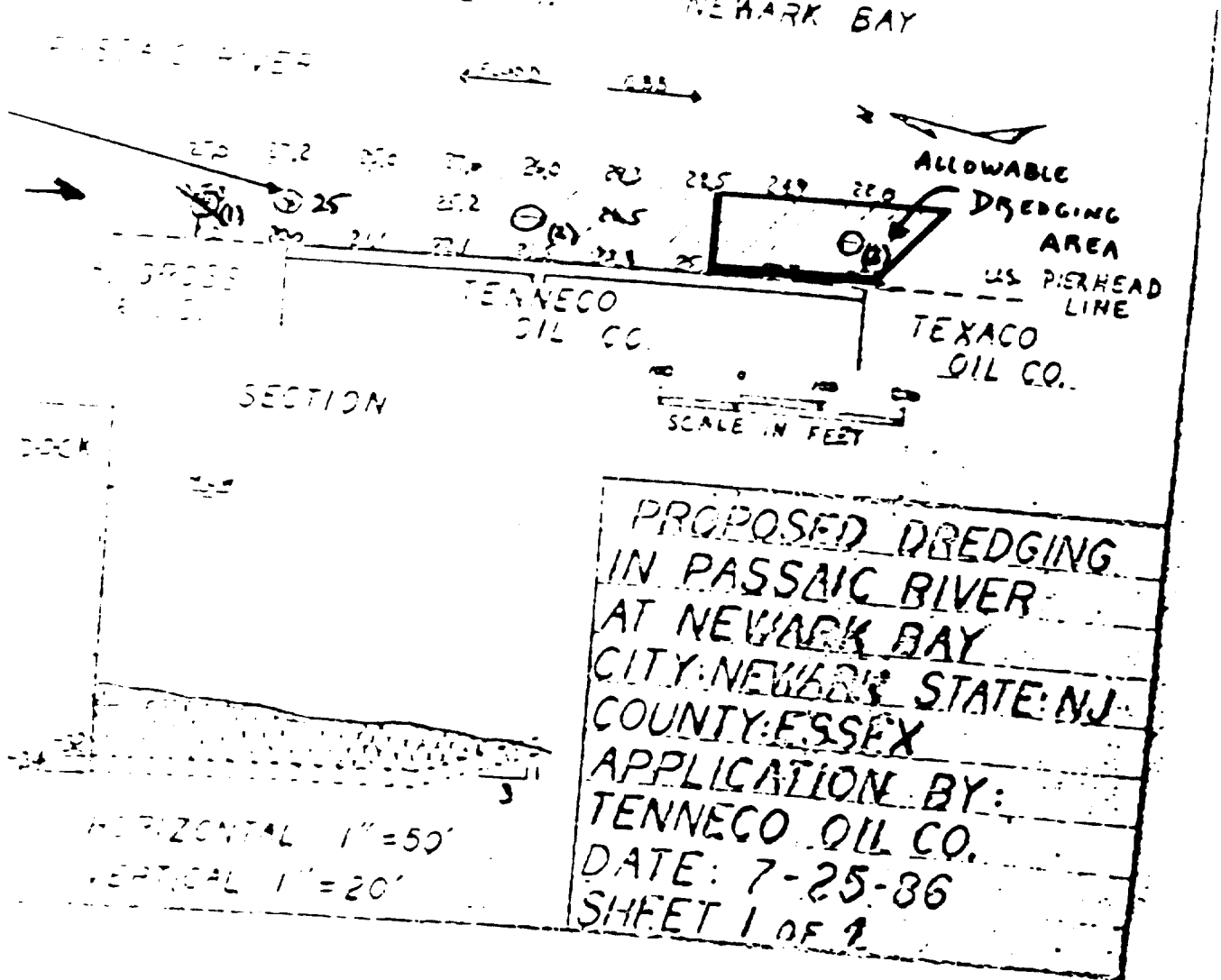
Applicant: Tenneco Oil Company
Waterway : Passaic River
Volume : 30,000 cubic yards

Testing : Bulk sediment testing

Avg. Grain Size: (sand - 19.3%, silt - 58.0%, clay - 22.7%)

Sample	TOC%	LLD_{25}	pptr	LLD_{50}	[TCDD]
1	2.6	18.9		37.7	89.6
2	3.2	23.2		46.4	74.7
3	3.1	22.5		44.9	42.5

Results : With the exception of site three, all TCDD concentrations exceeded the 50 pptr FDA levels of concern. Site three fell within the ocean dumping with expeditious capping range.



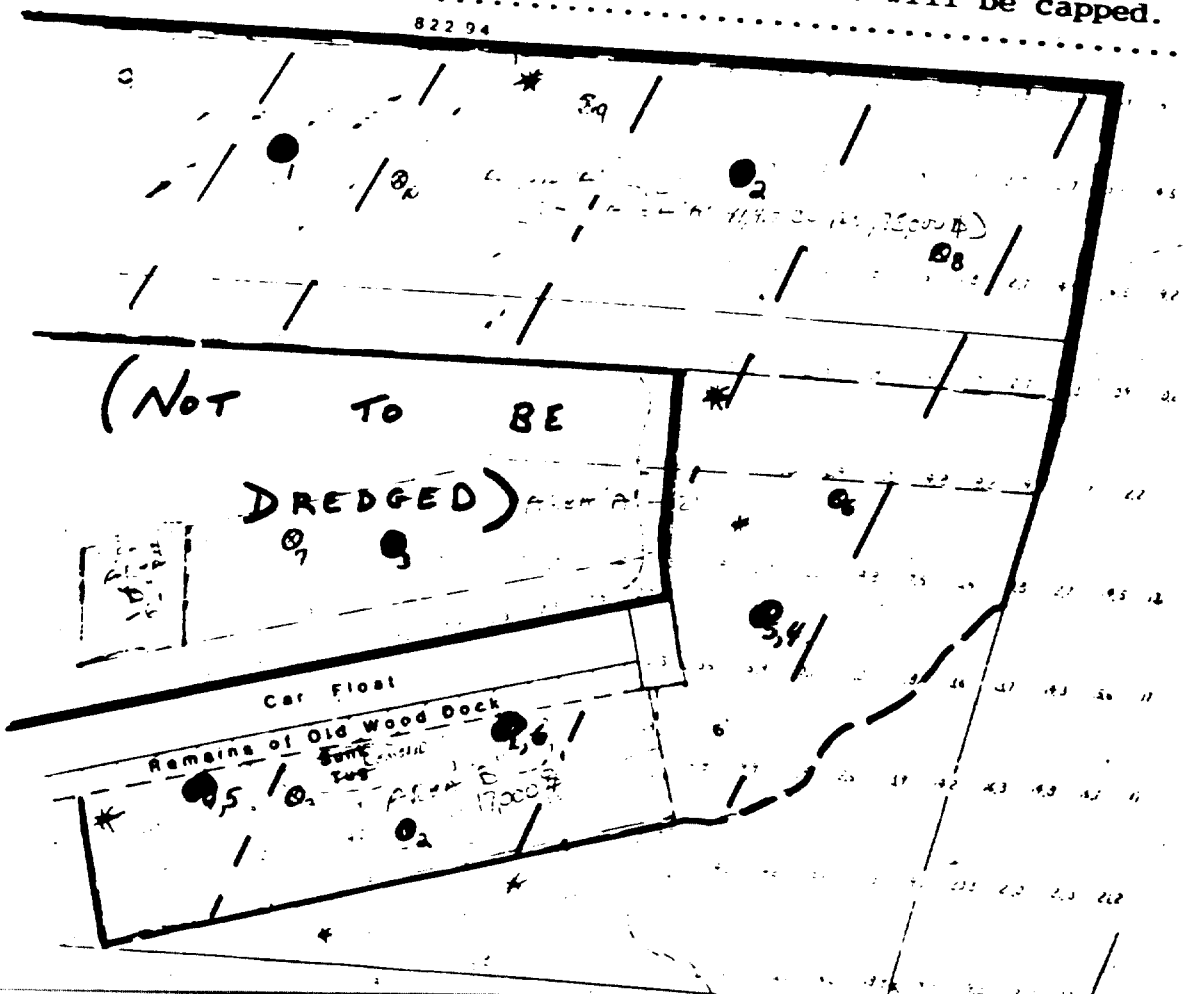
Applicant : Mariner's Harbor Marine Corporation
Waterway : Kill van Kull
Volume : 100,000 cubic yards

Testing : Bulk sediment testing

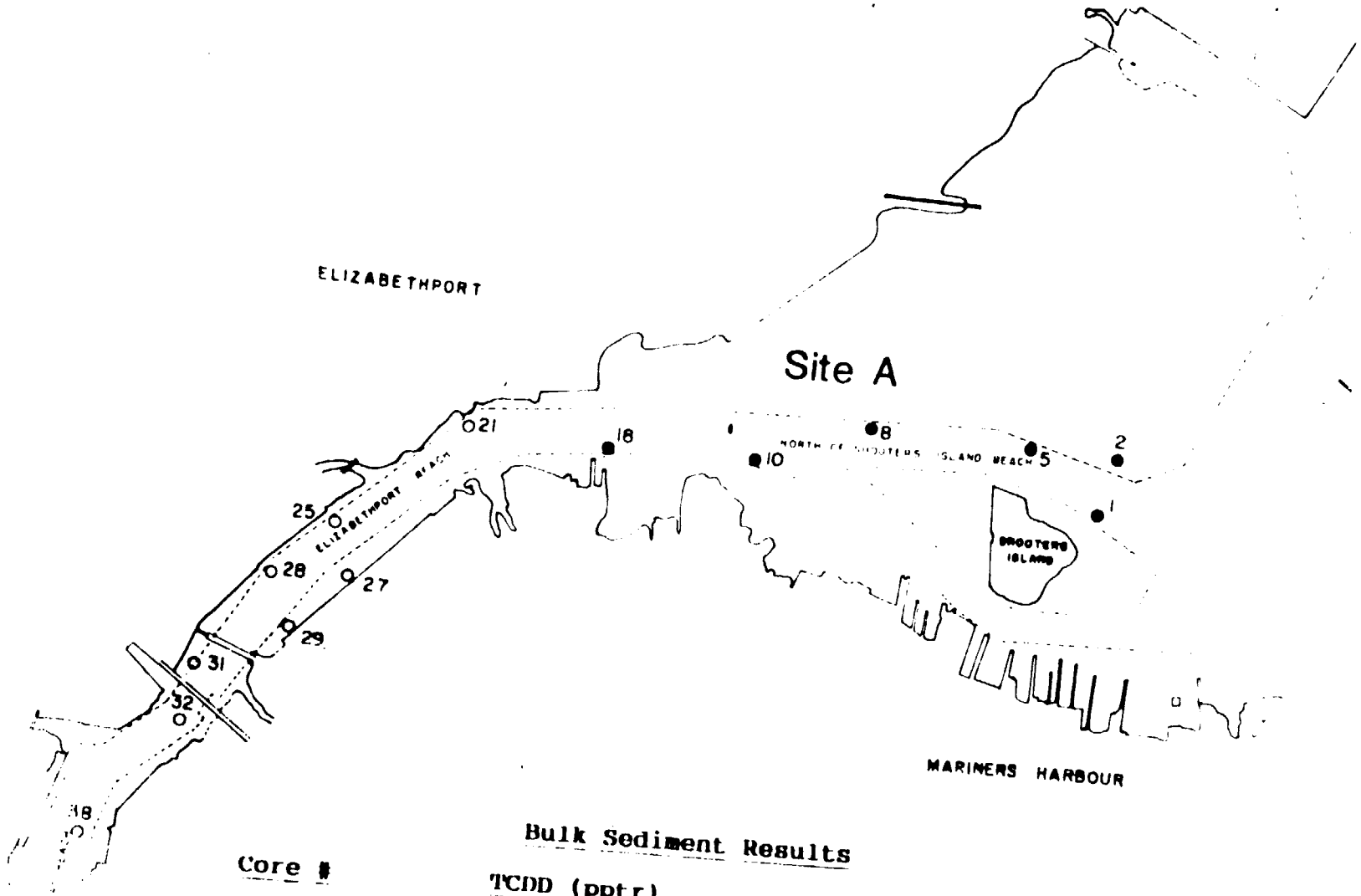
Avg. Grain Size: (sand - 28.7%, silt - 44.3%, clay - 27.0%)

Sample	TOC%	LLD_{25} pptr	LLD_{50}	[TCDD]	[TCDD DL]
1	4.0	29.05	58.09	73.1	
2	3.9	28.22	56.43	54.5	
3	4.4	31.73	63.79	86.6	
4	3.4	24.96	49.92	ND	2.0
5	3.3	23.96	47.93	53.4	
6	3.5	25.18	50.36	60.8	

Results : TCDD concentrations at all six sites were averaged using different sample site scenarios. It was determined that the dredged material from this project is suitable for ocean disposal with capping except in the vicinity of site three. All material dredged from the other sites must be disposed at the KVK buoy at the Mud Dump SIte where it will be capped.



Arthur Kill Deepening Project



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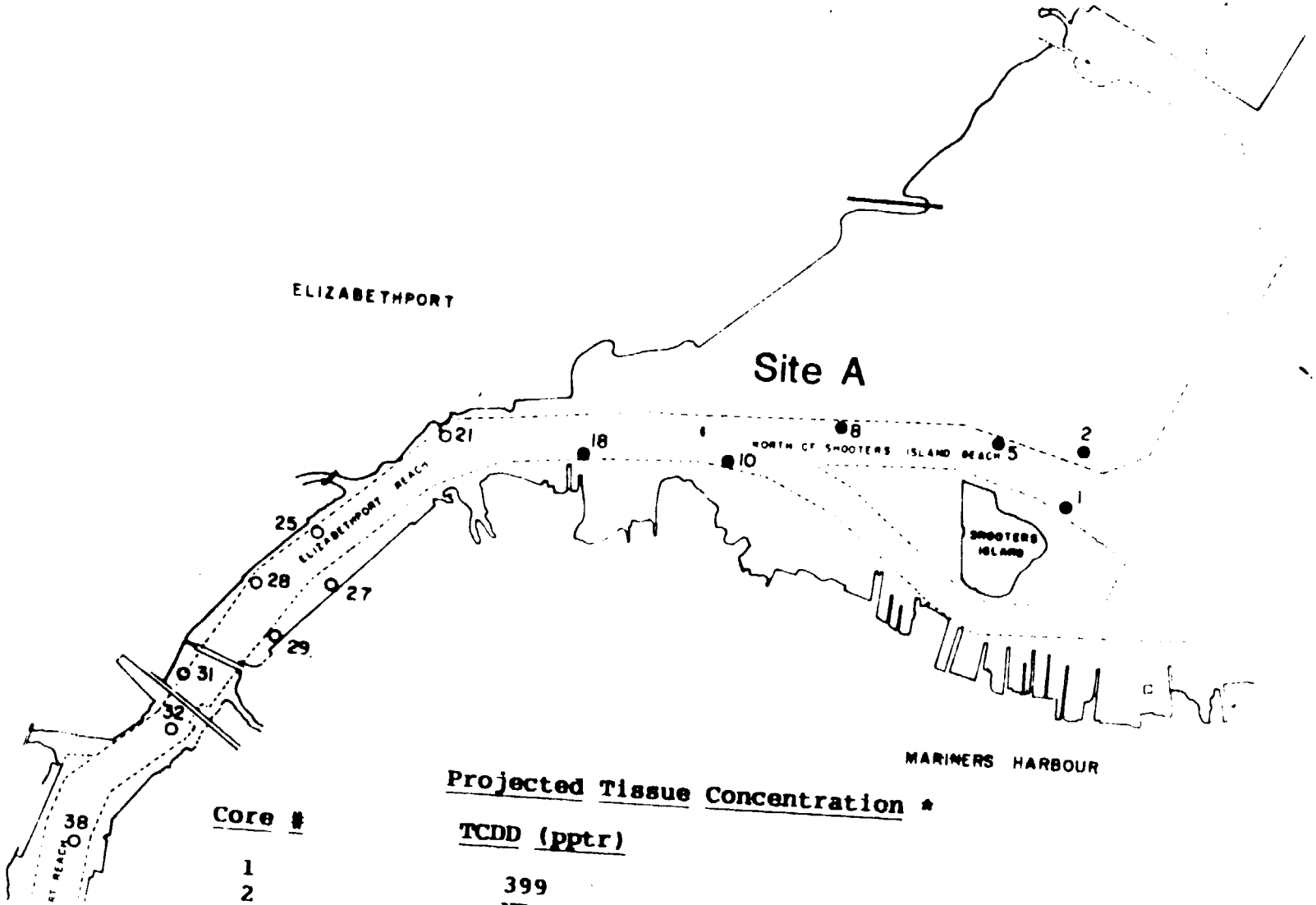
Arthur Kill Deepening Project



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Actual Tissue Concentration (10 day Bioassay)

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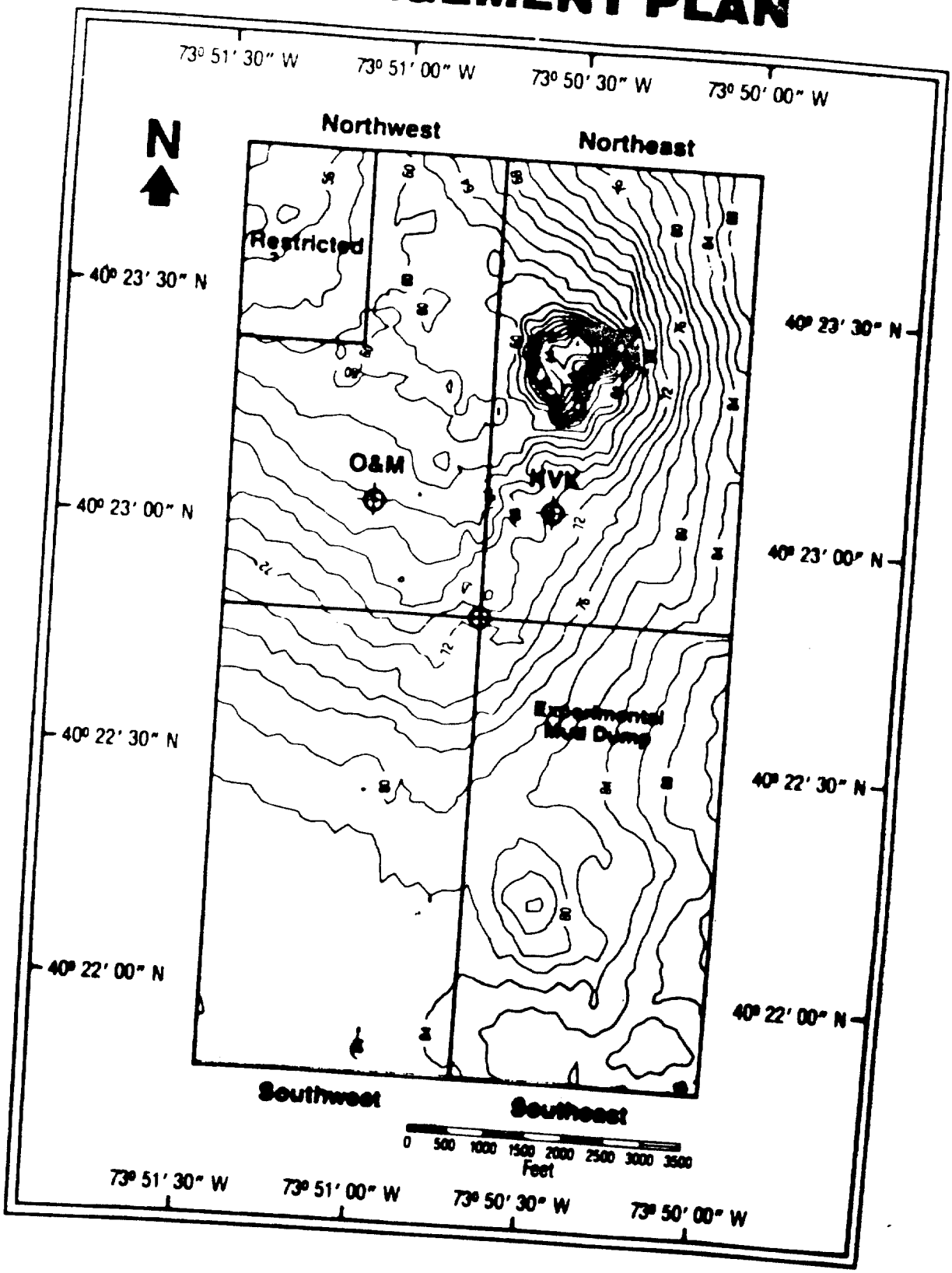
	3. ND	3. ND
	4. ND	4. ND
	5. ND	5. 2.7
Nereis virens (sandworm)		
	1. ND	1. 2.5
	2. ND	2. 2.3
	3. ND	3. 1.9
	4. ND	4. 1.9
	5. ND	5. 28.0

No statistical difference between reference and test

KILL VAN KULL/NEWARK BAY MANAGEMENT PLAN



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MAY 1987

2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6

JUNE

YC Pass. Term. Port Newark/Eliz
74,300

Marine Transfer St. Hudson R.
8,000

NORTH SHOOTER'S ISLAND CHANNEL (ARTHUR KILL) Total 207,295
79,950 127,345

S. Amboy
39,000

Navy Homeport, Stapleton
35,900

65th St. Brooklyn
39,401

Navy Homeport
443,546

NE BUOY

OM BUOY

NE Buoy removed
18 May

OM Buoy positioned
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s in cubic yards

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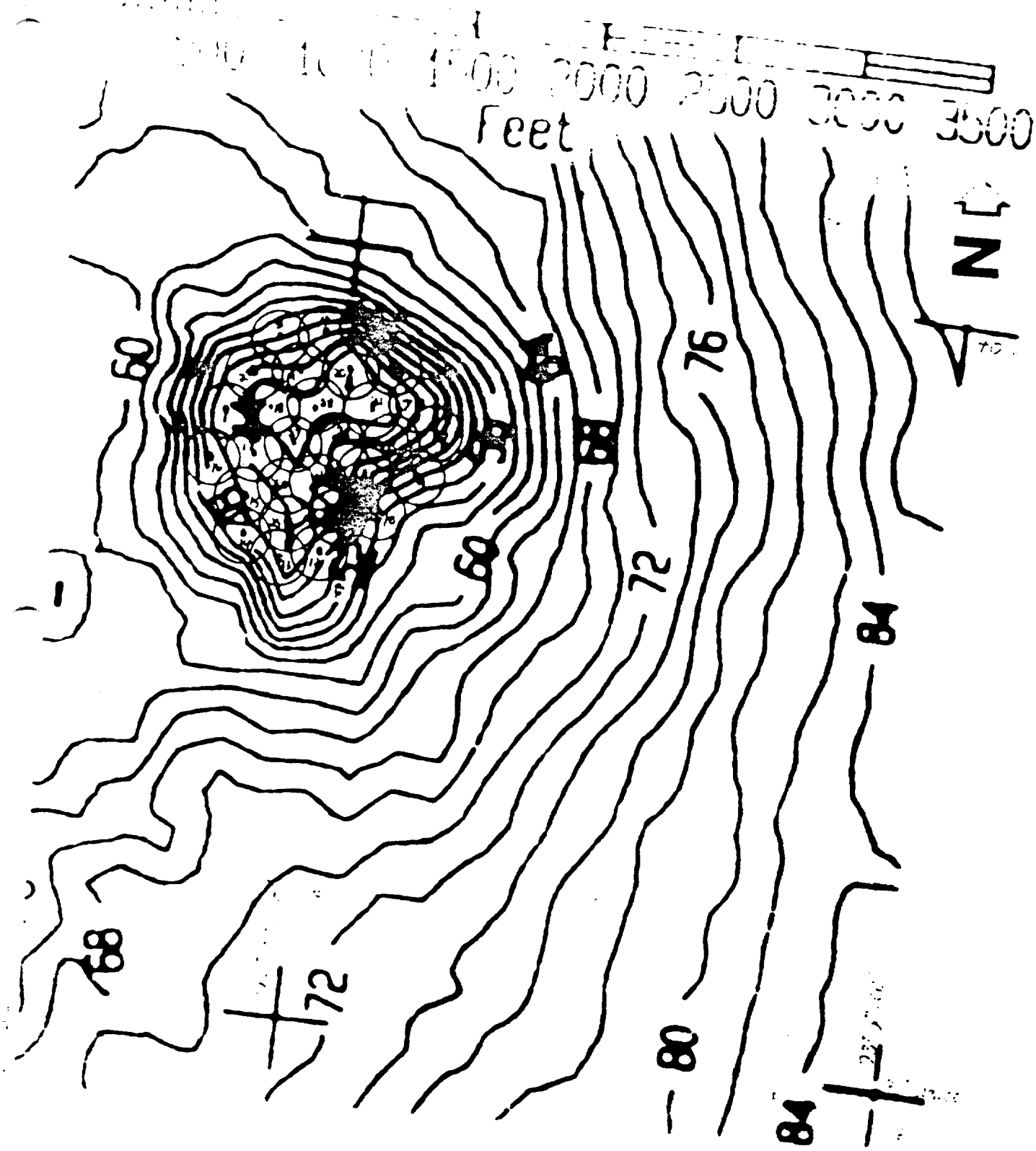

Disposal Cells (1-29) for Capping/Closure Operation
USACOE Dredge McFarland

17 September - 5 October 1987

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